

### 5.3.28 Norway lobster (*Nephrops norvegicus*) in Division VIIa – FU 15 (Irish Sea, West)

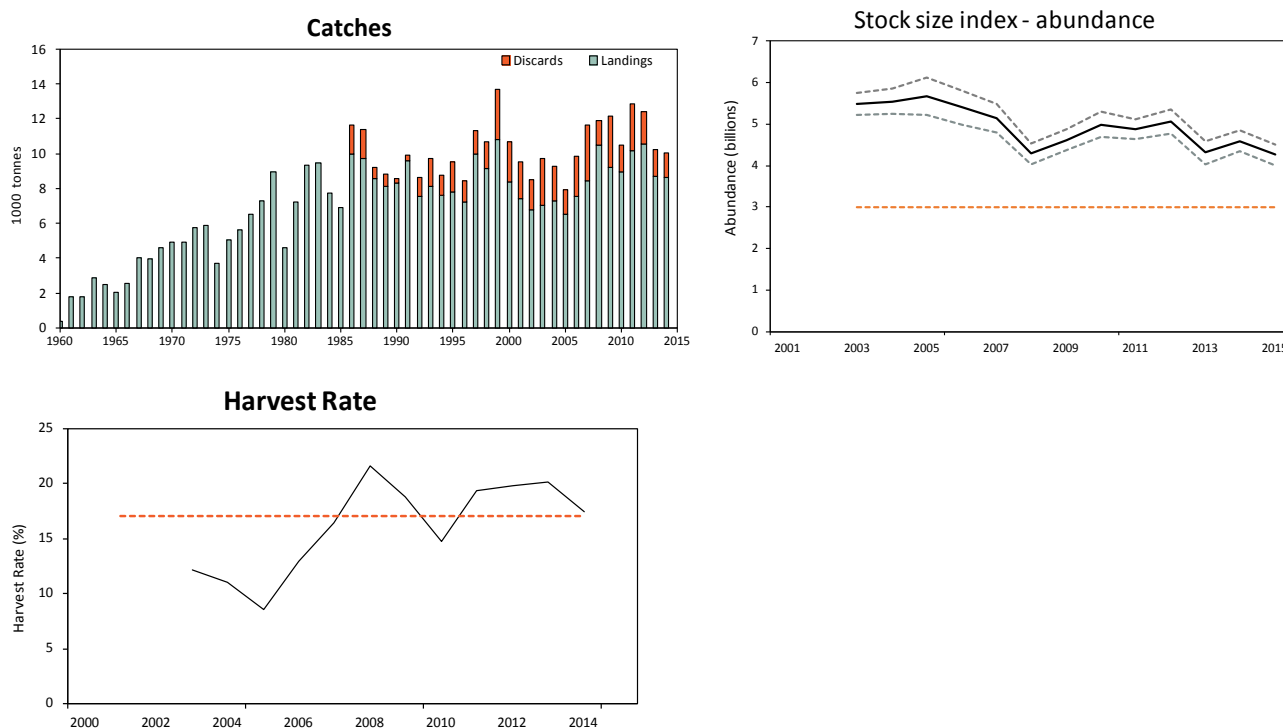
#### ICES stock advice

ICES advises that when the MSY approach is applied, catches in 2016 (assuming zero discards) should be no more than 8682 tonnes. If instead discards rates continue at recent values (average 2012–2014) and there is no change in assumed discard survival rate, this implies landings of no more than 7577 tonnes.

To ensure that the stock in functional unit (FU) 15 is exploited sustainably, management should be implemented at the functional unit level.

#### Stock development over time

Since 2003, stock abundance has been above MSY  $B_{trigger}$ . Recent harvest rates, calculated as (landings + dead discards)/(abundance estimate), are above the  $F_{MSY}$  proxy.



**Figure 5.3.28.1** Norway lobster in Division VIIa – FU 15. Catches (tonnes); recent UWT abundance (in billions; SSB proxy; 95% confidence intervals); and harvest rate (fishing mortality proxy). Prior to 2007 the harvest rate is considered to be a minimum estimate due to possible underreporting of landings. Orange dashed lines represent MSY  $B_{trigger}$  (upper panel) and  $F_{MSY}$  harvest rate proxy (lower panel).

#### Stock and exploitation status

**Table 5.3.28.1** Norway lobster in Division VIIa – FU 15. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size		
		2012	2013	2014	2013	2014	2015
Maximum sustainable yield	$F_{MSY}$	✘	✘	✘	✓	✓	✓
Precautionary approach	$F_{pa}, F_{lim}$	?	?	?	✓	✓	✓
Management plan	$F_{MGT}$	-	-	-	-	-	-
				Above			Above trigger
				Undefined			Above possible reference points
				Not applicable			Not applicable

## Catch options

**Table 5.3.28.2** Norway lobster in Division VIIa – FU 15. The basis for the catch options.

Variable	Value	Source	Notes
Stock abundance	4.259 billion individuals	ICES (2015a)	UWTV survey 2015
Mean weight in landings	13.52 g	ICES (2015a)	Average 2012–2014
Mean weight in discards	7.12 g	ICES (2015a)	Average 2012–2014
Discard proportion	24.9%	ICES (2015a)	Average (proportion by number) 2012–2014
Discard survival rate	10%	ICES (2015a)	Only applies in scenarios where discarding is allowed.
Dead discard rate	23%	ICES (2015a)	Average 2012–2014 (proportion by number). Calculated as dead discards divided by dead removals (landings + dead discards). Only applies in scenarios where discarding is allowed.

**Table 5.3.28.3** Norway lobster in Division VIIa – FU 15. The catch options. All weights are in tonnes.

Catch options assuming zero discards

Basis	Total catches	Wanted catches*	Unwanted catches*	Harvest rate**
MSY approach ( $F_{MSY}$ proxy)	8682	7388	1294	17.1%
$F_{0.1}$	5380	4578	802	10.6%
$F_{35\&SPR}$	6799	5786	1013	13.4%
$F_{2014}$	8880	7557	1323	17.5%
$F_{current}$ (2012–2014)	9719	8271	1448	19.1%

\* “Wanted” and “unwanted” catches are used to describe *Nephrops* that would be landed and discarded in the absence of the EU landing obligation, based on the average estimated discard rates for 2012–2014.

\*\* Applied to total catch.

Catch options assuming discarding allowed

Basis	Total catches	Dead removals	Landings	Dead discards	Surviving discards	Harvest rate*
	L+DD+SD	L+DD	L	DD	SD	for L+DD
MSY approach ( $F_{MSY}$ proxy) assuming recent discard rates	8904	8771	7577	1194	133	17.1%

\* Applied to dead removals.

All harvest rates are calculated in numbers and refer to the dead removals. The difference in catch weights between catch options with the same harvest rates is related to the fact that, in the scenario allowing for discarding, a proportion of the discards are assumed to survive.

## Basis of the advice

**Table 5.3.28.4** Norway lobster in Division VIIa – FU 15. The basis of the advice.

Advice basis	MSY approach.
Management plan	There is no management plan for Norway lobster in this area.

**Quality of the assessment**

An annual UWTV survey has taken place since 2003 which gives abundance estimates for the FU with high precision. The quality of input data and level of sampling are good for this stock.

**Issues relevant for the advice**

Fisheries catching *Nephrops* in Subarea VII will be covered by the EU landings obligation in 2016 (EC, 2015). While it is not yet clear how the landings obligation will be implemented, there is a possibility for a *De minimis* consisting of a 7% discard by weight (EC, 2015; Article 3.1.e). The average discard rate by weight (2012–2014) for FU 15 is 15%.

The density of *Nephrops* in FU 15 is considered very high (average density 0.9 individuals m<sup>-2</sup>) compared to other FUs. Recent harvest rates have been high (around F<sub>max</sub>) and the stock size has been stable at a high level. The exploitation rate between the sexes is similar. A harvest rate consistent with a combined sex F<sub>max</sub> of 17.1% is used as the proxy for F<sub>MSY</sub>.

There is a single TAC for the entire ICES Subarea VII. Management should be implemented at the functional unit level to ensure that fishing opportunities are in line with the scale of the resource in each of the stocks.

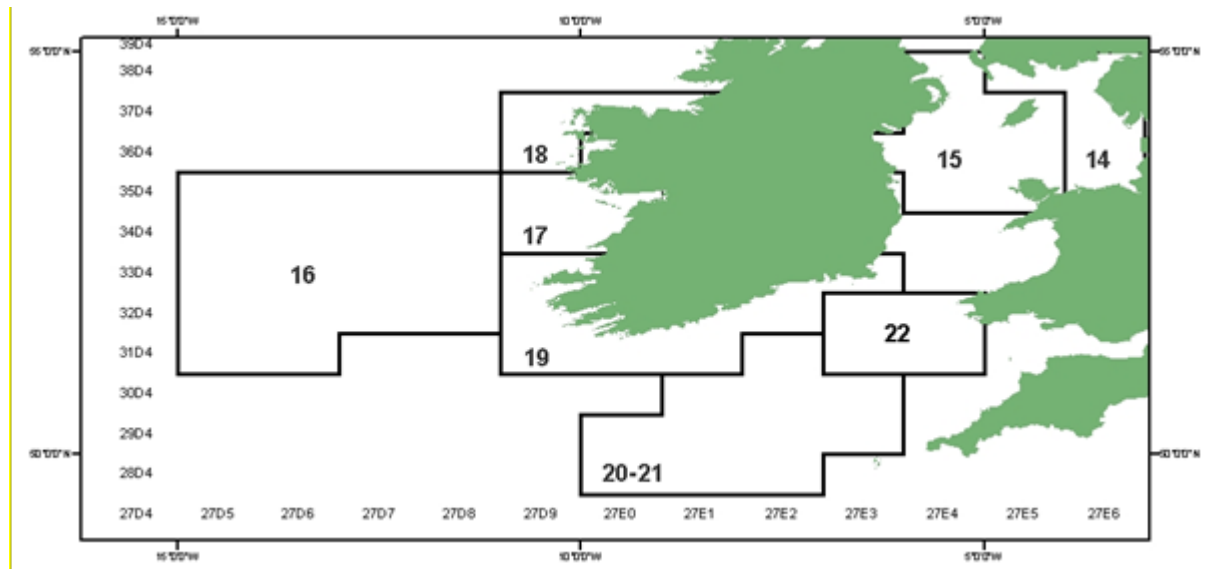


Figure 5.3.28.2 *Nephrops* functional units in Subarea VII.

## Reference points

**Table 5.3.28.5** Norway lobster in Division VIIa – FU 15. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	3 billion individuals	Minimum abundance observed based on a scaled trawl survey index.	ICES (2010)
	$F_{MSY}$	17.1% harvest rate	$F_{MSY}$ proxy equivalent to $F_{max}$ for combined sexes in 2010.	ICES (2010)
Precautionary approach	$B_{lim}$	Not defined.		
	$B_{pa}$	Not defined.		
	$F_{lim}$	Not defined.		
	$F_{pa}$	Not defined.		
Management plan	$SSB_{MGT}$	Not defined.		
	$F_{MGT}$	Not defined.		

## Basis of the assessment

**Table 5.3.28.6** Norway lobster in Division VIIa – FU 15. The basis of the assessment.

ICES stock data category	1 ( <a href="#">ICES, 2015b</a> ).
Assessment type	Underwater TV survey combined with yield-per-recruit analysis from length data.
Input data	One survey index (UWTV (FUs 14–15)); commercial catches (international landings, length frequencies from catch sampling); fixed maturity ogive based on survey sampling, fixed natural mortality. Discard survival rate.
Discards and bycatch	Included in the assessment since 2003; data series from the main fleets cover 98% of the landings.
Indicators	Length–frequency distributions of the catches by sex.
Other information	The latest benchmark (based on the UWTV survey) was performed in 2009 (ICES, 2009).
Working group	Working Group for the Celtic Seas Ecoregion ( <a href="#">WGCSE</a> ).

## Information from stakeholders

There is no available information.

**History of advice, catch, and management**

**Table 5.3.28.7** Norway lobster in Division VIIa – FU 15. History of ICES advice, the agreed TAC, and ICES estimates of landings.

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards**
1989					8.1	0.7
1990					8.3	0.3
1991					9.6	0.3
1992				8.9	7.5	1.1
1993				9.4	8.1	1.6
1994				9.4	7.6	1.2
1995				9.4	7.8	1.7
1996				9.4	7.3	1.2
1997				9.4	10.0	1.3
1998				9.4	9.1	1.6
1999				9.4	10.8	2.9
2000				9.4	8.4	2.3
2001				9.4	7.4	2.1
2002	Set TAC in line with 1995–99 landings			9.55	6.8	1.7
2003	Set TAC in line with 1995–99 landings			9.55	7.1	2.7
2004	Set TAC in line with 1995–99 landings			9.55	7.3	2.0
2005	Set TAC in line with 1995–99 landings			9.55	6.5	1.4
2006	No increase in effort			9.55	7.5	2.3
2007	No increase in effort	-		-	8.4	3.2
2008	No increase in effort	-		-	10.5	1.4
2009	No increase in effort and landings	< 8.5			9.2	2.9
2010	Harvest rate no greater than the equivalent to fishing at $F_{0.1}$	< 5.5			9.0	1.5
2011	Transition scheme towards the ICES MSY framework	< 9.5			10.2	2.7
2012	MSY approach	< 9.8			10.5	1.9
2013	MSY approach	< 9.3			8.7	1.6
2014	MSY approach	< 8.2			8.6	1.4
2015	MSY approach	< 8.223				
2016	MSY approach		≤ 8.682*			

\*Assuming all catches are landed and selection patterns do not change.

\*\* Dead + surviving discards.

**History of catch and landings**

**Table 5.3.28.8** Norway lobster in Division VIIa – FU 15. Catch distribution by fleet in 2014 as estimated by ICES.

Total catch	Landings		Total discards*
10 031 tonnes	~100% <i>Nephrops</i> otter trawls (70–99 mm)	< 0.5% pots	1418 tonnes
	8613 tonnes		

\* Dead + surviving discards.

**Table 5.3.28.9** Norway lobster in Division VIIa – FU 15. History of commercial catch and landings; ICES estimated values are presented by country participating in the fishery. All weights are in thousand tonnes.

Year	Ireland	UK	UK (E&W)	UK (NI)	UK (Scotland)	UK (Isle of Man)	Total
1965		1.018					1.018
1966		1.701					1.701
1967		2.077					2.077
1968		1.987					1.987
1969	1.011	2.803					3.814
1970	1.392	3.001					4.393
1971	1.384	3.190					4.574
1972	1.604	4.120					5.724
1973	1.863	4.031					5.894
1974	982	2.689					3.671
1975	909	4.165					5.074
1976	1.614	3.989					5.603
1977	2.469	4.045					6.514
1978	2.921	4.375					7.296
1979	3.436	5.512					8.948
1980	1.709	2.869					4.578
1981	3.202	4.047					7.249
1982	4.398	4.917					9.315
1983	4.324	5.124					9.448
1984	3.306	4.454					7.760
1985	2.421	4.480					6.901
1986	4.682	5.296					9.978
1987	4.639	5.114					9.753
1988	3.201	5.385					8.586
1989	2.477	5.651					8.128
1990	2.710	5.590					8.300
1991	3.371	6.183					9.554
1992	2.370	5.171					7.541
1993	2.715	5.387					8.102
1994	1.768	5.838					7.606
1995	2.259	5.538					7.796
1996	1.574	5.673					7.247
1997	3.349	6.622					9.971
1998	3.101	6.027					9.128
1999	4.582	6.198				6	10.786
2000	3.433	4.937				0	8.370
2001	2.689	4.749				3	7.441
2002	2.291	4.501				1	6.793
2003	2.709	4.352				4	7.065
2004	2.786	4.470				13	7.270
2005	2.133	4.420				0	6.554
2006	2.051		56	5.429	23	1	7.561

Year	Ireland	UK	UK (E&W)	UK (NI)	UK (Scotland)	UK (Isle of Man)	Total
2007	2.767		102	5.585	36	0	8.491
2008	3.132		131	7.166	26	50	10.508
2009	2.343		200	6.622	32	1	9.198
2010	2.578		100	6.251	33	0	8.963
2011	3.575		88	6.444	52	2	10.162
2012	3.794		106	6.586	39	3	10.529
2013	2.465		56	6.069	50	31	8.672
2014*	2.938		88	5.558	29	**	8.613

\* Provisional.

\*\* Included in UK (E&W) landings.

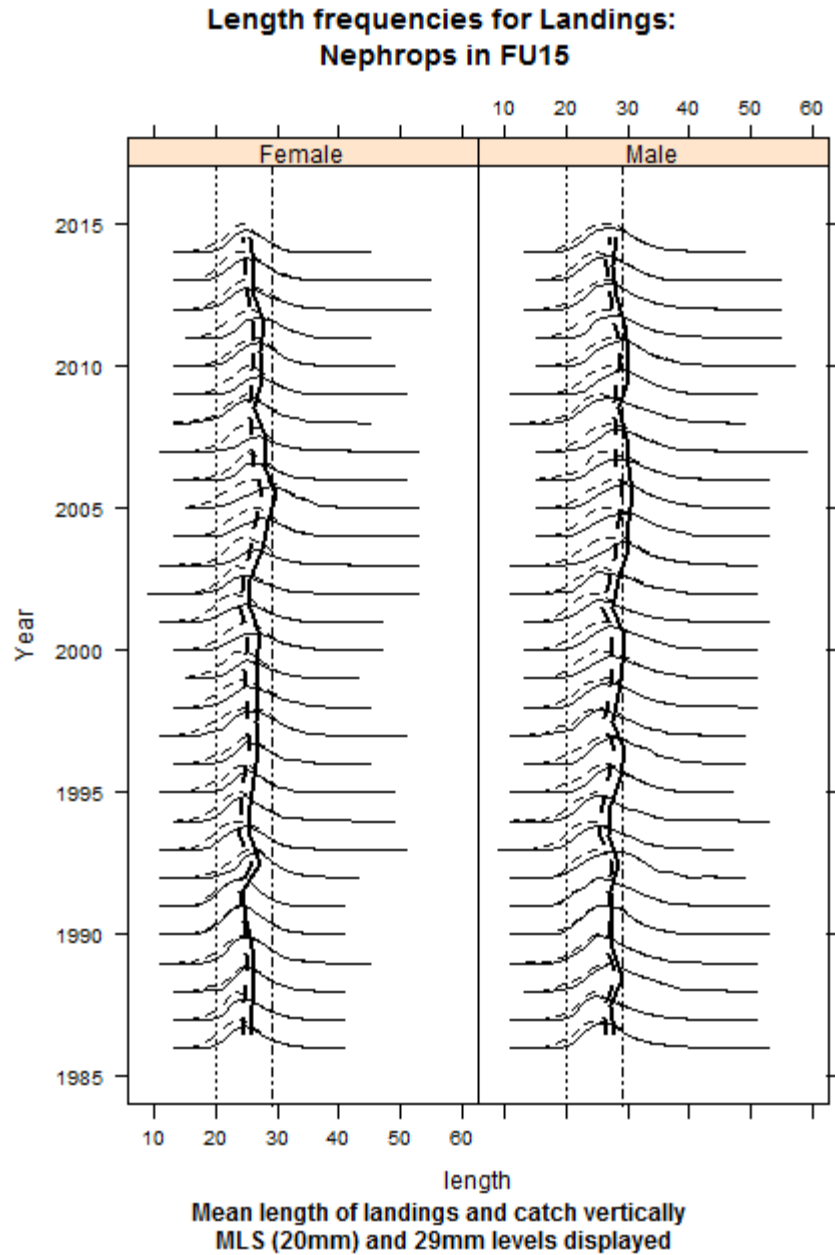
**Summary of the assessment**

**Table 5.3.28.10** Norway lobster in Division VIIa – FU 15. Assessment summary.

Year	Landings in number	Total discards in number *	Removals in number	UWTV abundance estimates	95% conf. intervals	Harvest rate	Landings**	Total discards***	Discard of catch by weight	Mean weight in landings	Mean weight in discards	Mean weight in catch
	millions	millions	millions	billions	millions	%	tonnes	tonnes	%	grammes	grammes	grammes
2003	404	291	666	5.5	0.27	12.1	7052	2659	27%	17.5	9.1	14.0
2004	416	218	612	5.5	0.3	11.0	7267	1993	22%	17.5	9.1	14.6
2005	346	157	488	5.7	0.44	8.6	6530	1412	18%	18.9	9.0	15.8
2006	467	261	701	5.4	0.41	13.0	7534	2285	23%	16.1	8.8	13.5
2007	511	375	848	5.1	0.34	16.5	8424	3246	28%	16.5	8.7	13.2
2008	755	191	927	4.3	0.25	21.6	10478	1421	12%	13.9	7.4	12.6
2009	567	335	868	4.6	0.26	18.8	9199	2934	24%	16.2	8.8	13.5
2010	572	180	733	5.0	0.31	14.7	8963	1539	15%	15.7	8.6	14.0
2011	644	332	943	4.9	0.23	19.4	10162	2683	21%	15.8	8.1	13.2
2012	771	258	1003	5.1	0.29	19.8	10529	1871	15%	13.7	7.2	12.1
2013	662	229	867	4.3	0.27	20.1	8672	1590	15%	13.1	7.0	11.5
2014	625	198	803	4.6	0.25	17.5	8613	1418	14%	13.8	7.2	12.2
2015				4.3	0.25							

\*Dead + surviving discards.

\*\*Version 2: values multiplied by 1000.



**Figure 5.3.28.3** Norway lobster in Division VIIa – FU 15. Annual length composition of catch (dashed) and landed (solid). Males (right) and females (left) from 1986 (bottom) to 2014 (top). The vertical dashed line is mean length in the catches and the vertical solid line is mean length in the landings. The straight vertical lines correspond to 20 mm (MLS) and 29 mm carapace length.



## Sources and references

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